

## Building a New Energy Future with Wind Power

Wind power is a clean, domestic, renewable energy source that can help the United States meet pressing environmental and economic challenges. Modern wind turbines capture the energy in our nation's winds to produce clean, reliable electricity while providing substantial economic benefits to surrounding communities and the nation as a whole. The wind industry's rapid expansion in the past few years underscores the potential for wind energy to supply 20% of the nation's electricity by the year 2030.

The United States has abundant wind resources, with enough resource potential to power the entire nation several times over. A 2010 study found that the U.S. land-based wind resource is 10,000,000 megawatts (MW), based on current wind turbine technology and wind speeds over the nation's windy lands. By the end of 2009, the United States led the world with 35,159 MW of installed wind capacity, ahead of Germany (25,177 MW) and China (25,104 MW). Total world wind capacity now approaches 158,000 MW.

The U.S. Department of Energy's (DOE's) Wind Program has examined the potential for wind energy to supply 20% of the nation's electricity by 2030, which would entail the installation of 300,000 MW of wind generating capacity. DOE's report, *20% Wind Energy by 2030*, found that the 20% wind energy scenario is not only technically feasible, but would also carry substantial benefits in of the reduction of greenhouse gas emissions, jobs creation, stimulated economic activity, and water use reductions.

### Industry Growth

Through a combination of improved technology, lower costs, stronger market confidence and increased public



The potential U.S. land-based wind resource is about 10,000,000 MW.

awareness and demand, more wind generation capacity was installed in the United States in 2009 than in any previous year, despite difficult economic conditions.

In 2009, the U.S. wind industry installed over 10,000 MW of generating capacity—enough to power over 2.4 million homes or generate as much electricity as three large nuclear power plants. Wind power represented 40% of all new U.S. electric generation capacity in 2009. According to the American Wind Energy Association, plants in 36 states now provide enough wind electricity to power nearly 10 million households while averting nearly 62 million tons of carbon emissions, equivalent to taking 10.5 million cars off the road.

The renewable energy industry creates thousands of long-term, high-technology careers in wind turbine component manufacturing, construction and installation, maintenance and operations, legal and marketing services, transportation and logistical services, and more. In 2009, the wind sector invested \$17 billion in the U.S. economy and employed 85,000 workers. A modern wind turbine has more than 8,000 component parts. To supply this market, 39 manufacturing facilities were brought online, announced, or expanded in 2009, bringing the total

number of wind turbine component manufacturing facilities now operating in the United States to more than 200.

In addition to providing our nation with competitively-priced electricity and high quality jobs, wind energy offers:

- Emissions-free electricity
- Job creation benefits, especially in the construction and manufacturing sectors
- Rural economic development including increased tax bases for local governments
- Reductions in water use by traditional electric generating facilities
- A domestic power source.

### The National Investment in Wind Energy: Building on Success

The Wind Program works with industry, DOE's national laboratories, state and local governments, and other federal agencies to advance wind technology and support the responsible wide-scale deployment of wind energy. Previous partnerships led to turbine technology advances that have lowered the cost of wind energy from 80 cents per kilowatt-hour to as low as five to eight cents per kilowatt-hour today.

Major efforts to build on this record of success include:

- **Advancing large wind turbine technology:** The program conducts competitively selected, cost-shared research and development projects with industry to further improve reliability, increase capacity factors, and decrease costs of large wind turbine technology. Current areas of focus include advanced rotor development, gearbox reliability initiatives, design validation, and component testing.
- **Supporting grid interconnection:** The program works to address the interconnection impacts, electric power market rules, operating strategies, and system planning needed to facilitate the interconnection and integration of increasing amounts of wind energy into the nation's electric grid.
- **Bolstering domestic manufacturing and creating jobs:** The program helps



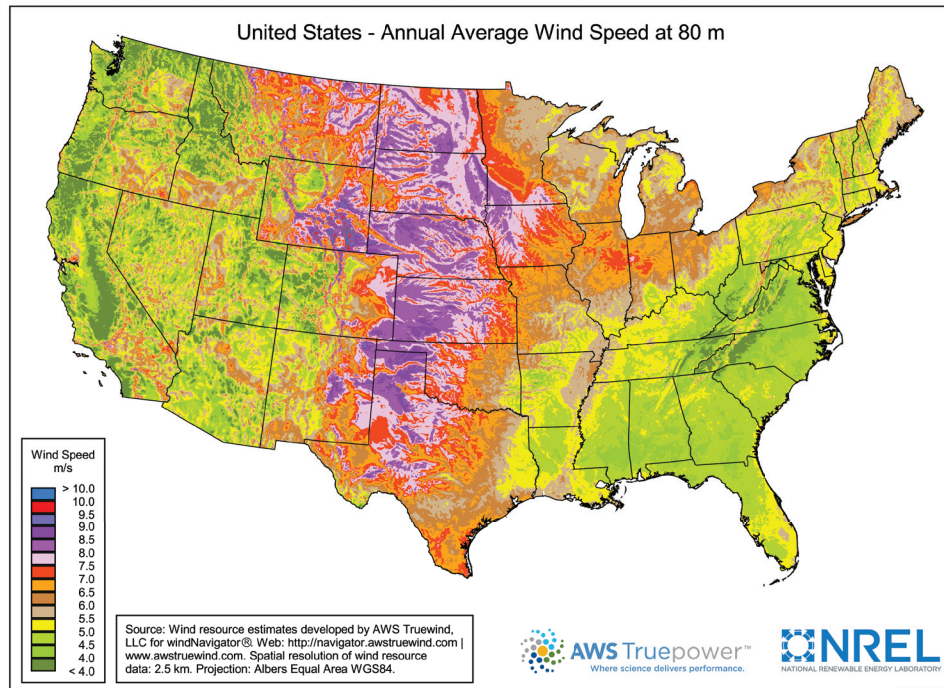
National Renewable Energy Laboratory technicians install DOE's 1.5 MW GE wind turbine at the National Wind Technology Center.

industry develop robust and cost-effective manufacturing processes to increase the domestic supply chain for wind components, and it invests in programs to grow the skilled workforce needed for tomorrow's wind industry.

- **Overcoming barriers to deployment:** The program works with states and other stakeholders through its Wind Powering America outreach

and education initiative as well as forums such as the National Wind Coordinating Collaborative. In order to overcome barriers to the expanded use of wind technology, the program provides objective information on wind energy policy, siting, and the economic benefits and challenges of wind development.

The American Reinvestment and Recovery Act provided investments in wind energy that began to bear fruit in 2009 and will have significant impacts through 2012 and beyond. Incentives for wind power authorized by the Recovery Act include a three-year extension of the production tax credit, alternatives to tax credits for renewable energy systems, and a 30% investment credit. Recovery Act funds also support wind energy through new research and development projects and wind turbine testing facilities, loan guarantees for renewable energy, efficient electrical transmission, and the Advanced Research Projects Agency-Energy.



United States wind resource at 80 meters (262 feet) above the ground.

## For More Information

Contact the EERE Information Center at 1-877-EERE-INF or 1-877-337-3463 or visit [www.windandwater.energy.gov](http://www.windandwater.energy.gov).

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Energy Efficiency &  
Renewable Energy

EERE Information Center  
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Prepared by the National Renewable Energy Laboratory (NREL)  
NREL is a national laboratory of the U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
Operated by the Alliance for Sustainable Energy, LLC

DOE/GO-102010-3065 May 2010